



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

24392 7590 02/17/2010

FISH & ASSOCIATES, PC  
ROBERT D. FISH  
2603 Main Street  
Suite 1000  
Irvine, CA 92614-6232

EXAMINER

YOUNG, NATASHA E

ART UNIT

PAPER NUMBER

1797

DATE MAILED: 02/17/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,435	06/06/2005	John Mak	100325.0193US	3213

TITLE OF INVENTION: LOW PRESSURE NGL PLANT CONFIGURATIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/17/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

## HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to:** Mail **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
 or Fax **(571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

24392 7590 02/17/2010

**FISH & ASSOCIATES, PC**  
**ROBERT D. FISH**  
**2603 Main Street**  
**Suite 1000**  
**Irvine, CA 92614-6232**

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,435	06/06/2005	John Mak	100325.0193US	3213
TITLE OF INVENTION: LOW PRESSURE NGL PLANT CONFIGURATIONS				

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/17/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
YOUNG, NATASHA E	1797	422-187000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_  
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
 Typed or printed name \_\_\_\_\_ Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,435	06/06/2005	John Mak	100325.0193US	3213
24392	7590	02/17/2010	EXAMINER	
FISH & ASSOCIATES, PC ROBERT D. FISH 2603 Main Street Suite 1000 Irvine, CA 92614-6232			YOUNG, NATASHA E.	
			ART UNIT	PAPER NUMBER
			1797	
			DATE MAILED: 02/17/2010	

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 466 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 466 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability****Application No.**

10/528,435

**Examiner**

NATASHA YOUNG

**Applicant(s)**

MAK, JOHN

**Art Unit**

1797

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to remarks filed October 28, 2009.
2. ☒ The allowed claim(s) is/are 1-7 and 9-20.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_.

## DETAILED ACTION

### ***Allowable Subject Matter***

Claims 1-7 and 9-20 are allowed.

The closest prior art references are Vijayaraghavan et al (US 5,566,554), Finn et al (US 6,363,744 B2), Buck (US 4,617,039), and Lee et al (US 6,354,105 B1).

Regarding claim 1, Vijayaraghavan et al discloses a natural gas liquid plant, comprising: a separator (6) that is configured to allow separation of a cooled low pressure feed gas (1) into a liquid portion and a vapor portion, and a first pressure reduction device (24) that is configured to receive the liquid portion and to allow reduction of pressure of the liquid portion to provide refrigeration for a first cooler (8) that is fluidly coupled to the separator and that is configured to allow cooling of a low pressure feed gas to thereby allow formation of the cooled low pressure feed gas; a second pressure reduction device (20); and a demethanizer (36) (see column 3, line 7 through column 4, line 58 and figure 1).

Finn et al discloses a cooled low pressure feed gas (2) having a feed gas pressure of at or below 1100 psig (see Table 1).

Lee et al discloses a natural gas liquid plant, comprising: a separator (34a) that is configured to allow separation of a cooled low pressure feed gas at about feed gas pressure into a liquid portion and a vapor portion, and a first pressure reduction device (see figure 4) that is configured to receive the liquid portion and to allow reduction of pressure of the liquid portion; a second cooler (26) and a second pressure reduction

device (see figure 4) fluidly coupled to the separator (34a), wherein the second cooler (26) is configured to allow cooling of at least part of the vapor portion, and wherein the second pressure reduction device is configured to reduce pressure of the part of the vapor portion to a degree effective to provide the part of the vapor portion to an absorber (28a) as lean absorber reflux; and wherein the absorber is configured to produce an absorber overhead product to thereby provide refrigeration for the second cooler (26), and wherein the absorber (28a) is further configured to produce an absorber bottoms product, and a demethanizer (28) fluidly coupled to the absorber and configured to receive the absorber bottoms product (see figure 4 and column 9, line 35 through column 10, line 14).

The prior art references do not disclose or suggest a natural gas plant wherein a demethanizer is fluidly coupled to the absorber and configured to receive the absorber bottoms product as lean reflux and it would not have been obvious to one having ordinary skill in the art at the time the invention was made to combine the references because express motivation to combine the references is lacking.

Claims 2-7 depend on claim 1.

Regarding claim 9, Vijayaraghavan et al discloses a NGL plant comprising: a primary cooler (8) that is configured to cool a low pressure feed gas, a separator (6) that is configured to separate the cooled low pressure feed gas at about feed gas pressure in a liquid portion and a vapor portion; a first pressure reduction device (24) configured to reduce pressure of the liquid portion to thereby provide refrigeration for the primary cooler; a pressure reduction device that is configured to expand the vapor portion (20);

and a demethanizer (36) (see column 3, line 7 through column 4, line 58 and figure 1).

Finn et al discloses a cooled low pressure feed gas (2) having a feed gas pressure of at or below 1100 psig (see Table 1).

Buck discloses a primary and secondary cooler (100, 102) that are configured to cool a low pressure feed gas, and a first pressure reduction device (104) that is configured to reduce pressure of the liquid portion to thereby provide refrigeration for the secondary cooler (102) (see figure 1 and column 3, line 43 through column 4, line 51).

Lee et al discloses a cooler (26) that is configured to cool at least part of the vapor portion, and a pressure reduction device (see figure 4) that is configured to expand the cooled vapor portion; and an absorber (28a) that is configured to receive the cooled and expanded vapor portion and to produce an overhead product that provides refrigeration for the cooler (26) and a bottom product fed into a demethanizer (28) (see figure 4 and column 9, line 35 through column 10, line 14).

The prior art references do not disclose or suggest a natural gas plant wherein the absorber bottom product is employed as reflux in a demethanizer and it would not have been obvious to one having ordinary skill in the art at the time the invention was made to combine the references because express motivation to combine the references is lacking.

Claims 10-15 depend on claim 9.

Regarding claim 16, Vijayaraghavan et al discloses a natural gas liquid plant that comprises a separator (6) that is configured to receive a cooled low pressure feed gas

(1) at about feed gas pressure and that is fluidly coupled to a demethanizer (36), wherein the plant is further configured such that refrigeration duty of the demethanizer is provided at least in part by expansion of a liquid portion of the cooled low pressure feed gas from the feed gas pressure (12, 14) and an expansion of a vapor portion from the feed gas pressure using a device (20) other than a turboexpander, and wherein the demethanizer is configured to receive the expanded liquid portion as demethanizer feed (see column 3, line 7 through column 4, line 58; column 7, lines 17-34; and figure 1).

Finn et al discloses a cooled low pressure feed gas (2) having a feed gas pressure of at or below 1100 psig (see Table 1).

Lee et al discloses a separator (34a) that is fluidly coupled to an absorber (28a) and a demethanizer (28), wherein the plant is further configured such that refrigeration duty of the absorber (28a) and demethanizer (28) are provided at least in part by expansion of a liquid portion of the cooled low pressure feed gas from the feed gas pressure (120, 80) and an expansion of a vapor portion from the feed gas pressure using a device (100) other than a turboexpander (see figure 4; column 5, line 50 through column 6, line 42; column 9, line 51 through column 10, line 14).

It would not have been obvious to one having ordinary skill in the art at the time the invention was made to combine the references because express motivation to combine the references is lacking.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jain et al (US 2001/0052241 A1) discloses that the quality of the



lean reflux can be further improved by replacing the separation step by a mass transfer step, which may use an absorber as the mass transfer device (see paragraph 0014)..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is 571-270-3163. The examiner can normally be reached on Mon-Thurs 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Y./  
Examiner, Art Unit 1797

/Walter D. Griffin/  
Supervisory Patent Examiner, Art Unit 1797